No. 8500062

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Purdue University Agricultural Experiment Station and USDA-ARS

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, [THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM,]* TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS PRESCRIBED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

(*Waived, except that this waiver shall not apply to breeder seed, foundation seed, labeling requirements, and blending limitations.)

WHEAT

'Adder'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 31st *day of* May *in the year of our Lord one thousand nine hundred and* eighty-eight.

Attest:

Kenneth B. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

APPROVAL EXPIRES 4-30-85

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION	3. VARIETY NAME
Director, Purdue Univ. Agric. Experiment Station and ARS-USDA	IN74141A10-5-4-2	Adder

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*	5. PHONE *(Include area code)*	FOR OFFICIAL USE ONLY PVPO NUMBER
Purdue University West, Lafayette, In 47907	317-494-8360	8500062

6. GENUS AND SPECIES NAME	7. FAMILY NAME *(Botanical)*	FILING DATE / TIME
Triticum aestivum	Gramineae	2/7/85 2:30 ☐ A.M. ☒ P.M.

8. KIND NAME	9. DATE OF DETERMINATION	FEES RECEIVED
Wheat	July 26, 1984	AMOUNT FOR FILING $ 1,800 DATE 2/7/85 AMOUNT FOR CERTIFICATE $ 2000 DATE April 19, 1988

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*

Agricultural Experiment Station

11. IF INCORPORATED, GIVE STATE OF INCORPORATION	12. DATE OF INCORPORATION
Established by Federal Law (Hatch Act)	1889

13. NAME AND ADDRESS OF APPLICANT REPRESENATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

Dr. B. R. Baumgardt, Director
Purdue University Agricultural Experiment Station
West Lafayette, IN 47907

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*

b. ☒ Exhibit B, Novelty Statement

c. ☒ Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*

d. ☒ Exhibit D, Additional Description of the Variety

e. ☒ EXHIBIT E, SEE EXHIBIT A.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☒ Yes *(If "Yes," answer items 16 and 17 below)* ☐ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ Yes ☐ No	☒ Foundation ☒ Registered ☒ Certified

18. DID THE APPLICANT(S) FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☒ Yes *(If "Yes," give date)* this application
☐ No

19. HAS THE VARIETY BEEN OFFERED FOR SALE OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

☐ Yes *(If "Yes," give names of countries and dates)*
☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT	DATE
W. R. Baumgardt	2-1-85
SIGNATURE OF APPLICANT	DATE

14A. Exhibit A, Origin and Breeding History of the Variety

Adder (PI 491,396) was developed by the Purdue University Agricultural Experiment Station in cooperation with ARS, US Department of Agriculture. The parentage of Adder is Abe/3/Redcoat//Knox 62 sib/Dular/4/Knox// Centenario/Rio Negro/3/Riley sib/5/Abe/Caldwell sib. Adder was tested as IN 74141A10-5-4-2 before naming.

Following the last cross the new variety was developed by a modified pedigree method of breeding. Individual plants were selected in the F_1, F_2, F_3, and F_4 generations. Single plant progeny rows were selected in F_5. Thirty seven of 100 progeny rows with a 0 to trace reaction to powdery mildew versus those with 0 to 5% or 5% powdery mildew; resistance to leaf rust; and uniform in plant type were composited for breeder seed. In 1984 a few plants with brown glumes (dominant character) were rogued out of the breeder seed lot. Breeder seed was in the F_{11} generation of selfing in 1984.

Adder has been tested for performance in advanced nursery yield trials for 5 years, 1980-1984 (Table 1); in intra-state field plots for 4 years, 1981-1984 (Tables 2 to 5); and in the regional Uniform Eastern Soft Red Winter Wheat Performance Nurseries for 3 years, 1982-1984. It has been tested in disease nurseries and for reaction to the Hessian fly since 1978. Adder has been tested for soft wheat milling and baking qualities since 1979.

We consider Adder to be true breeding.

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14B. Exhibit B, Novelty Statement

Adder is most similar to Auburn for general plant type, disease resistances and winter hardiness. However, Adder is 3 to 4 inches shorter and kernels of Adder average 3 g/1000 heavier than those of Auburn. Adder is moderately resistant to soil-borne mosaic and wheat spindle streak mosaic, Auburn is moderately susceptible to these viruses. Adder has a snaky peduncle and Auburn has a straight peduncle.

14B. Exhibit B, Novelty Statement

Adder is a soft red winter wheat with a unique combination of plant characters and disease and Hessian fly resistances. Its most obvious unique plant characters inlcude short culms, snaky neck (peduncle), awnlets which are long in the upper portion of the spikes, and moderately large seed. It has the H6 gene for resistance to the Hessian fly.

Adder is moderately resistant to the virus diseases soil-borne mosaic, yellow dwarf, and wheat spindle streak mosaic (Table 6). In the adult plant stage it is moderately resistant to septoria leaf blotch (Table 7) and to leaf rust occurring naturally at Lafayette, Indiana including races of Puccinia recondita virulent on the Lr9 source of resistance from the germplasm line Transfer (Table 8). It is moderate in reaction to the Rhizoctonia and take-all root rots (Tables 10 and 11).

Adder has good milling and baking qualities (Table 12).

The novelty of Adder can be established by comparing the variety with other varieties with the H6 gene for resistance to the Hessian fly. Adder is shorter in culm length than Knox 62, Caldwell, Auburn, or Fillmore. It has yellow glumes whereas Compton has brown glumes. Adder has a pronounced snaky neck whereas Auburn has a slight snakiness of neck and the other above varieties have straight necks. Adder has numerous (averaging 8 to 10) long tip awnlets generally averaging about 3 to 4 cm in length. Other varieties with the H6 gene have few or no long tip awnlets. Adder has larger kernel size than Caldwell or Auburn. Adder differs from other varieties, which have the H6 gene for resistance to Hessian fly, in reaction to one or more diseases.

FORM APPROVED: OMB NO. 0581-0055

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN AND SEED DIVISION
BELTSVILLE, MARYLAND 20785

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Director, Purdue Univ. Agric. Experiment Station

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
West Lafayette
IN 47906

FOR OFFICIAL USE ONLY
PVPO NUMBER 8500062

VARIETY NAME OR TEMPORARY DESIGNATION
Adder

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:
[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:
[2] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____ [1] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) _____

[2] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[2][3][0] FIRST FLOWERING [2][3][7] LAST FLOWERING

4. MATURITY (*50% Flowering*):
[ ][ ] NO. OF DAYS *EARLIER* THAN ..... [1] 1 = ARTHUR 2 = SCOUT 3 = CHRIS
[ ][3] NO. OF DAYS *LATER* THAN ..... [ ] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (*From soil level to top of head*):
[ ][9][1] CM. HIGH
[ ][ ] CM. TALLER THAN ..... [1]
[1][2] CM. SHORTER THAN ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (*See reverse*):
[2] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[2] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom: 1 = ABSENT 2 = PRESENT
[1] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[ ][4] NO. OF NODES (*Originating from node above ground*)
[1][7] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[2] Anthocyanin: 1 = ABSENT 2 = PRESENT
[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____
[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[1][2] MM. LEAF WIDTH (*First leaf below flag leaf*)
[2][5] CM. LEAF LENGTH (*First leaf below flag leaf*):

8500062

11. HEAD:

[2] Density: 1 = LAX 2 = DENSE

[2] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER *(Specify)* _____

[2] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[2] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER *(Specify)*: _____

[0 6] CM. LENGTH [1 5] MM. WIDTH

12. GLUMES AT MATURITY:

[2] Length: 1 = SHORT *(CA. 7 mm.)* 2 = MEDIUM *(CA. 8 mm.)* 3 = LONG *(CA. 9 mm.)*

[2] Width: 1 = NARROW *(CA. 3 mm.)* 2 = MEDIUM *(CA. 3.5 mm.)* 3 = WIDE *(CA. 4 mm.)*

[3] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[2] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[2] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[2] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[1] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[1] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[4] Phenol reaction *(See instructions)*: 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER *(Specify)* _____

[0 6] MM. LENGTH [0 3] MM. WIDTH [3 4] GM. PER 1000 SEEDS

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[2] STEM RUST *(Races)* 151,15B

[2] LEAF RUST *(Races)* Natural at Lafayette IN

[0] STRIPE RUST *(Races)* _____

[0] LOOSE SMUT

[2] POWDERY MILDEW

[0] BUNT

[2] OTHER *(Specify)* septoria tritici blotch

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[1] SAWFLY

[2] APHID *(Bydv.)*

[0] GREEN BUG

[1] CEREAL LEAF BEETLE

[ ] OTHER *(Specify)* _____

HESSIAN FLY RACES: [2] GP [2] A [2] B [1] C [1] D [ ] E [ ] F [ ] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Abe	Seed size	Beau
Leaf size	Compton	Seed shape	Abe
Leaf color	Arthur	Coleoptile elongation	Abe
Leaf carriage	Caldwell	Seedling pigmentation	Auburn

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

FEB 7 1985

14D. Exhibit D, Additional Description of the Variety

Plant color at booting is medium green like Arthur 71. The flag leaf is recurved to inclined at booting similar to Caldwell. The leaf below the flag leaf is about the width of that of Caldwell but averages longer than leaves of Caldwell (25 cm vs 19 cm). The auricles may exhibit moderate levels of anthocyanin.

A slight waxy bloom is generally present on the stem and slight anthocyanin may be present. The peduncle is snaky (wavy).

The spike is mid-dense with awnlets most prominent at the tip of the spike.

Adder was resistant in the seedling stage to some cultures of races 11-32-113, 151, and 15B of Puccinia graminia in tests of the ARS-USDA Cereal Rust laboratory, St. Paul, Minnesota in 1984. In the adult stages Adder is moderately resistant to powdery mildew and to leaf rust occurring naturally at Lafayette Indiana. It has moderate resistance to the septoria tritici blotch disease and to Rhizoctonia spring blight and take-all.

Table 1. Comparative performance of wheat varieties in nursery yield trails at Lafayette, Indiana, 1980-1984.

Variety	Yield bu/A	Test wt. lb/bu*	Kernel wt. g/1000	Headed May	Height cm	Pre-ripe straw score**
			5-year average			
Adder	76.7	59.6	34.0	25.6	88	2.9
Compton	74.5	61.0	36.6	24.9	97	3.9
Auburn	78.3	60.4	31.0	25.0	97	3.2
Caldwell	83.3	60.8	30.6	22.6	96	3.0
Fillmore	76.0	60.9	34.1	27.2	105	3.6
Beau	67.4	61.6	37.0	24.4	96	3.6
Arthur	73.2	61.3	36.7	22.4	100	5.2
Monon	64.9	60.4	33.5	21.8	105	5.9
BLSD†	7.9	1.9	2.4	1.3	6.6	1.4
C.V.%	8.0	1.6	5.6	4.4	5.2	27.2

* Four year average.

** Straw scored from 0 = erect to 9 = lodged flat.

† BLSD = The Waller-Duncan Bayesian k ratio (at k=100) for the test of significance of the difference between any two variety means.

Table 2. Comparative performance of wheat varieties in field plots in northwestern Indiana (Porter County) , 1981-1984*.

Variety	Yield (bu/A)	Test wt (lb/bu)	Date headed (mo.-day)	Plant height (in)	Post-ripe lodging (%)	Winter killing (%)
			4-year average			
Caldwell	74.4	57.9	6-02	37	12	1
Auburn	73.7	59.7	6-03	37	4	2
Fillmore	71.5	59.8	6-05	38	5	2
Adder	71.5	58.0	6-04	34	3	2
Pike	71.1	58.1	6-03	39	10	1
Compton	69.5	59.6	6-04	36	7	2
Titan	66.2	57.0	6-06	41	11	2
S76	65.9	58.9	6-03	37	4	1
Beau	64.9	60.5	6-03	38	6	2
Hart	64.6	58.7	6-03	39	7	2
Roland	64.3	57.8	6-04	35	10	2
Arthur	63.9	60.0	6-02	39	21	2
Monon	57.2	58.6	6-01	43	24	1
BLSD**	7.9	1.3	2	2	22	NS
C.V.(%)	6.1	1.5	3	4	55	64

* Data from Performance trials of K. M. Day and reported in part in Purdue Univ. Agric. Exp. Stn. Bull. No. 454, 1984.

** BLSD = The Waller-Duncan Bayesian K ratio (at K = 100) for the test of significance of difference between any two variety means.

Table 3. Comparative performance of wheat varieties in field plots in west central indiana (Tippecanoe County), 1981 and 1983-84*.

Variety	Yield (bu/A)	Test wt (lb/bu)	Date headed (mo.-day)	Plant height (in)	Post-ripe lodging (%)	Winter killing (%)
			3-year average			
Caldwell	89.6	58.2	5-29	40	8	0
Adder	86.7	58.1	6-02	38	3	0
Pike	85.3	58.6	5-30	41	4	0
Compton	85.2	60.6	6-01	40	8	0
Auburn	84.2	59.4	5-31	41	3	0
S76	81.9	59.7	5-31	41	3	0
V8088	81.8	56.5	5-31	43	8	0
Fillmore	80.8	59.6	6-01	44	14	0
Roland	80.2	58.8	5-31	38	4	0
Hart	75.4	59.8	5-29	42	3	0
Titan	75.3	57.8	6-03	45	5	0
Beau	74.0	61.6	5-30	40	4	0
Arthur	73.0	60.6	5-29	43	12	0
Monon	63.6	58.8	5-28	45	23	0
Vigo	55.3	59.0	6-05	57	20	0
BLSD**	8.4	2.4		2	NS	NS
C.V.(%)	5.3	1.1		3	64	

* Data from performance trials of K. M. Day and O. W. Luetkemeier and reported in part in Purdue Univ. Agric. Exp. Stn. Bull. No. 454, 1984.

** BLSD = the Waller-Duncan Bayesian K ratio (at K = 100) for the test of significance of the difference between any two variety means.

Table 4. Comparative performance of wheat varieties in special late seeded field plots in west central Indiana (Tippecanoe County), 1983 and 1984*.

Variety	Yield (bu/A)	Test wt (lb/bu)	Date headed (mo.-day)	Plant height (in)	Post-ripe lodging (%)	Winter killing (%)
			2-year average			
Caldwell	84.6	59.8	6-03	39	6	3
Adder	84.6	58.7	6-06	38	1	3
Compton	82.6	61.7	6-06	39	3	3
Auburn	80.0	59.8	6-04	40	6	3
Fillmore	76.7	61.2	6-06	42	19	2
Arthur	76.3	61.9	6-03	42	4	3
Monon	66.0	61.1	6-02	45	12	3
BLSD**	6.0	1.2		2		NS
C.V.(%)	5.4	0.9		2		22

* Data from performance trials of K. M. Day and O. W. Luetkemeier and reported in part in Purdue Univ. Agric. Exp. Stn. Bull. No. 454, 1984.

** BLSD = the Waller-Duncan Bayesian K ratio (at K = 100) for the test of significance of the difference between any two variety means.

Table 5. Comparative performance of wheat varieties in field plots in east central Indiana (Randolph County), 1981-1984*.

Variety	Yield (bu/A)	Test wt (lb/bu)	Date headed (mo.-day)	Plant height (in)	Post-ripe lodging (%)	Winter killing (%)
			4-year average			
Pike	62.6	56.1	5-28	39	12	3
Caldwell	61.9	54.4	5-27	38	8	3
Auburn	60.2	56.6	5-29	39	10	2
Adder	58.9	54.9	5-30	36	7	4
Compton	58.3	56.9	5-29	38	21	4
Roland	58.3	55.6	5-29	36	8	3
Hart	57.9	56.7	5-28	40	7	3
Fillmore	57.3	57.7	5-31	41	13	4
Beau	56.2	58.6	5-28	40	14	3
Titan	54.4	55.7	6-02	42	13	4
Arthur	54.3	57.8	5-26	40	19	3
Monon	47.8	56.8	5-25	42	23	2
BLSD*	7.2	1.9		2	NS	
C.V.(%)	11.2	1.9		5	66	

* Data from performance trials of K. M. Day and reported in part in Purdue Univ. Agric. Exp. Stn. Bull. No. 454, 1984.

** BLSD = the Waller-Duncan Bayesian K ratio (at K = 100) for the test of significance of the difference between any two variety means.

Table 6. Comparative reactions to virus diseases of wheat varieties in disease nurseries, 1980-1984*.

Variety	Soil-borne mosaic** (5)†	Yellow dwarf incited by BYDV (3)≠	Yellow dwarf incited by BYDV (2)ξ	Wheat spindle streak mosaic 1981-1982	Wheat spindle streak mosaic 1983-1984
Adder	3.2	7.3	4.3	4.5	3.0
Compton	4.3	6.6	4.1	4.5	2.0
Auburn	4.6	5.2	3.8	5.0	6.0
Caldwell	5.2	4.6	4.3	5.5	5.0
Fillmore	4.3	5.2	4.3	6.0	3.0
Beau	4.4	5.3	4.5	4.0	5.0
Arthur	4.5	--	4.9	---	6.0
Monon	1.9	4.5	3.6	3.5	3.0

* Reactions are scored from 0 = immune to 9 = very susceptible.

** Reactions in the soil-borne mosaic nursery at Urbana, Illinois.

† Number of years in a mean.

≠ Average of 2 replications with PAV virus strain, 1980-82.

ξ Average of 2 replications and two virus strains, PAV and RPV, 1983-84.

Table 7. Adult plant reactions in the field to septoria tritici leaf blotch.

Variety	Severity score (0-10) and reaction type*				
	1980	1981	1982	1983	1984
Adder	5 B	7.5	4	4.5 C	6.0 A
Compton	5 B	8.0	5	5.0 C	6.0 C
Auburn	5 A	7.0	5	4.0 A-B	6.0 C
Caldwell	6 A	8.0	6	4.5 B	6.0 A
Fillmore	5 C	7.5	6	4.0 B	6.0 C
Beau	7 C	8.0	6	6.0 C	6.0 C
Arthur	7 B	8.5	6	6.5 C	6.0 B
Monon	8 C	9.5	7	6.5 C-D	6.5 C

* Severity scored from 0 = no leaf necrosis to 10 = all leaves necrotic on a whole plant basis before natural leaf senescence. Reaction type: A = no pycnidia in lesions to D = abundant pycnidia in lesions.

Table 8. Reaction to powdery mildew in the adult plant stage in the field at Lafayette, Ind.*

Variety	Powdery mildew (%) in the field**		
	1980	1981	1984
Adder	5	1	5
Compton	0	Tr	5
Auburn	Tr	Tr	0
Caldwell	Tr	3	1
Fillmore	0	1	0
Beau	Tr	5	5
Arthur	10	10	5
Monon	5	60	5

* Naturally occurring races of the Erysiphe graminis.

** Percent of leaf area affectd (Tr = trace).

Table 9. Leaf rust severity and reaction type at the adult plant stage in the field and to a leaf rust fungus (Puccinia recondita) culture virulent to the Lr9 source of resistance in the seedling stage*.

Variety	Leaf rust infection and infection type				
	1980	1981	1982	1983	1984
	Severity and adult reaction type in the field**				
Adder	0	1 MR-MS	Tr R,few 30S	5	Tr
Compton	0	0 R-TrMS	Tr R	0	0
Auburn	Tr	2 R	Tr R	Tr	0
Caldwell	Tr	0 R	15 HR-MS	Tr	5
Fillmore	0	10 R-15MS	Tr, few 10S	Tr	Tr
Beau	Tr	20 S	60 S	15	10
Arthur	20	30 S	70 S	30	7
Monon	40	60 S	80 S	70	5
	Seedling reaction†				
Adder	4, 1N	3	3 C, ON	3	3
Compton	0	0	0 C	0 N, 2	0 N
Auburn	4, 2 C	3, 0	3, 0	3	3+, ON
Caldwell	4, 0 CN	3	3+	4	4
Fillmore	1N to 2N	3, 1, ON	2 C	4, 2	3- N
Beau	4, 0 C	3	3+	4	3
Arthur	3 C, 0 N	3	3+	4	3
Monon	4	3	3+	4	4

* To races of the pathogen occurring naturally at Lafayette, Indiana.

** Percent of flag leaf area (modified Cobb scale) covered by uredinia, and reaction types:
R = resistant fleck or necrotic reaction; S = large sporulating uredinia; H = highly and M = moderately; Tr = Trace.

† Seedling reactions from 0 = immune to 4 = highly susceptible; N = necrosis; and C = chlorosis.

Table 10. Comparative response of wheat varieties to Rhizoctonia spring blight and take-all at Knox, Indiana in 1982 - 1984†.

	Disease index						Yield		
	Rhizoctonia*			Take-all**			g/4-foot row		
Variety	1982	1983	1984	1982	1983	1984	1982	1983	1984
Adder	16	20	0	7.5	4.0	1.8	64	98	118
Compton	22	30	0	8.3	3.8	2.0	-	81	108
Auburn	32	12	0	7.8	4.0	2.0	62	89	108
Beau	33	28	0	8.5	5.3	3.0	40	64	94
Caldwell	35	35	0	5.8	4.8	3.1	56	60	91

* Percent stand reduction by Rhizoctonia spring blight.

** Root rot index at late flowering stage; 0 = no infection to 10 = 100% infection.

† Research data of D. M. Huber, Plant Pathologist, Purdue University in a test with high severity of infection.

Table 11. Comparative response of wheat varieties to the take-all disease at Lafayette, Indiana, in 1982-84*.

	White heads (%)	Disease score** 0-4		Yield plot† g		
Variety	1982	1983	1984	1982	1983	1984
Adder	45.0	2.75	2.0	112	293	316
Compton	27.5	--	1.5	108	---	291
Auburn	20.0	2.25	1.5	110	236	296
Caldwell	50.0	2.75	--	55	167	---
Abe	35.0	3.00	2.3	41	148	227

* In a nursery with the soil artificially infested with Gaeumannomyces graminis and then grown in continuous wheat for 6 years. Data are from the research of G.E. Shaner and G. C. Buechley, Plant Pathologists, Purdue University.

** 0 = symptomless to 4 = severe take-all.

† Two replications in 1982 and one in 1983 with 8 square feet harvested per plot. In 1984 3 replications were harvested with 12 square feet harvested per plot.

Table 12. Quality characteristics of wheat varieties as determined by the Soft Wheat Quality Laboratory, Wooster, OH.

Variety	Milling quality score	Baking quality score
	1979 Advanced Yield Nursery, Lafayette, Indiana*	
Adder	110A‡	115A
Auburn	106A	108A
Caldwell	110A	111A
Beau	100A	100A
	1980 Advanced Yield Nursery, Lafayette, Indiana*	
Adder	111A	113A
Auburn	109A	85D
Caldwell	112A	96B
Beau	95C	90C
Sullivan**	100A	100A
	1981 Indiana Drill Plot Composite of 4 Locations†	
Adder	113A	108A
Auburn	108A	92C
Caldwell	111A	115A
Beau**	100A	100A
	1982 Indiana Drill Plot Composite of 4 Locations†	
Adder	89.7D	98.9B
Auburn	91.1C	83.5E
Caldwell**	100.0A	100.0A
Beau	78F	80.3E
	1983 Indiana Drill Plot Composite of 3 Locations†	
Adder	106.0A	101.5A
Auburn**	100.0A	100.0A
Caldwell	106.9A	96.4B
Beau	93.9C	89.5D

* Test sample size = 500 g.

** The varietal standard for the respective tests.

† Test sample size = 9 kg.

‡ Letters following scores indicate quality classification based on several characters in relation to the standard variety. A = as good or better than the standard; B = detectably lower quality for one character based on established laboratory precision; C = detectable lower quality for two characters; etc.

United States Department of Agriculture
Agricultural Marketing Service
Livestock, Meat, Grain, and Seed Division
National Agricultural Library Building
Beltsville, MD. 20705

PLANT VARIETY PROTECTION OFFICE

Gentlemen:

Subject: Application No. 8500062
Variety and Kind: 'Adder' Wheat

As provided in section 83(a) of the Plant Variety Protection Act, 7 U.S.C. 2321, we request that the Certificate on the above variety be issued with a notation on the Certificate that the right to exclude others from selling, offering for sale, reproducing, importing or exporting the variety covered by this Certificate, or using it in producing a hybrid or different variety is waived, except that this waiver shall not apply to breeders seed, foundation seed, labeling requirements, and blending limitations.

It has been agreed that the Certificate should be issued in the name(s) of:

PURDUE UNIVERSITY
USDA-ARS

2-15-84
(Date)

V F Leuthauser
(Signature)

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